RESEARCH HIGHLIGHT

May 2009

Technical Series 09-102

Code Requirements and Costs of Incorporating Accessory Apartments in Houses

INTRODUCTION

Canada Mortgage and Housing Corporation commissioned a study in 2004 to compare the impact of different building code requirements across Canada on the cost and relative performance of accessory apartments in houses. The term 'accessory apartment' is generally used to describe a second housing unit in a private home, which is also called an 'in-law suite' and a 'secondary suite'. These units – basement apartments are the most common type – offer affordable housing for renters. They can also provide an income stream and extra security for older home owners with extra space, and help first-time home buyers enter the housing market.

Unfortunately, accessory apartments are restricted by a number of regulatory hurdles, including some of the requirements in building and fire codes. Building codes set out requirements for new construction of these apartments, either in existing homes or in completely new buildings. Fire codes set out requirements for existing apartments in existing buildings. Over the years, there have been requests for changes to code requirements that discourage accessory apartments in houses. Responses have varied from one jurisdiction to another.

In Canada, building and fire regulations are a provincial/territorial responsibility, except in a few municipalities, which have their own charters. The National Research Council produces model national building and fire codes, which all provinces and territories (except PEI) adopt as is, adopt with changes and direct their municipalities to adopt, or harmonize as far as possible with their own codes. While there is quite a high degree of uniformity across the country for the vast majority of code provisions, this is not true for accessory apartments.

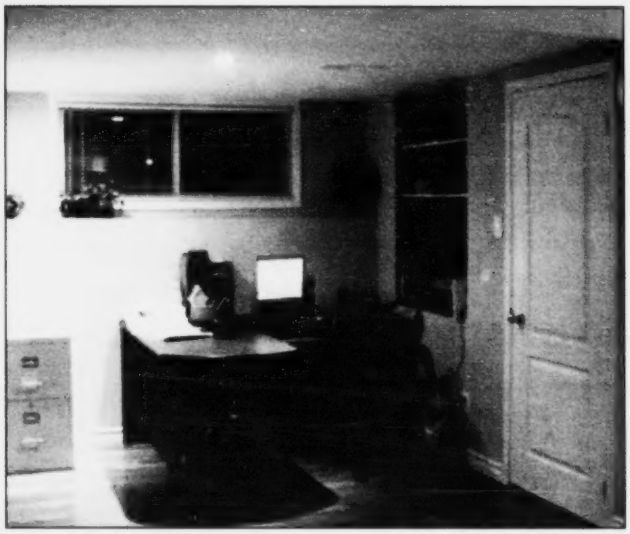

Photo by: John Burrows

Figure 1 Accessory apartment work area

Currently the Model National Building Code of Canada (NBC) does not address accessory apartments. For many of its provisions the NBC requires construction of houses containing one principal residence and one accessory apartment to achieve the same level of safety performance as small walk-up apartment buildings. The NBC or the related Provincial and Territorial codes regulate accessory apartments in private homes through Part 9 requirements for duplexes and multi-unit buildings. The applicable provisions impose additional egress and exiting and fire protection requirements compared with what is normally required for a single dwelling unit. This approach is followed in the many parts of the country where the NBC is adopted with few or no changes.

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But some provinces and municipalities have taken different approaches which help to encourage accessory apartments as a means of increasing the affordable housing stock. They also help to encourage owners of non-conforming units to bring them up to acceptable levels of safety. These regulations or bylaws often allow levels of safety similar to a single dwelling unit and/or define how some parts of existing construction can be accepted for renovation projects. Which code requirements are in effect can have a large impact on the feasibility and use of accessory apartments.

A number of studies have been done, showing how code requirements in one jurisdiction or another increase costs for new construction, and/or make adding an accessory apartment to an existing house virtually impossible. However, no study compared code requirements in different jurisdictions, and evaluated costs and performance of the varying approaches. Therefore, CMHC commissioned a research project to explore these issues.

STUDY OBJECTIVES

This project had five main objectives:

- to identify key issues and relevant code provisions in the NBC affecting construction of accessory apartments in new construction and in existing buildings,
- to collect information about code requirements applying to accessory apartments in effect in different jurisdictions in 2005-2006,
- to compare the code requirements applying to accessory apartments based on level of performance,
- to compare the code requirements applying to accessory apartments based on costs of compliance, and
- to assess the relative impacts of different building and fire code provisions applying to accessory apartments, leading to better harmonization.

Photo by: John Burrows

Figure 2 Accessory apartment living area

METHODOLOGY

Review of NBC and Identification of Key Issues

The consultants reviewed the provisions of the 1995 NBC (the one in effect at that time in parts of Canada). They focused on requirements affecting accessory apartments in the basement, attic, or attached to a house. Only those requirements that would be *over and above* the requirements for a single dwelling unit were evaluated. Where applicable, changes found in the just-released 2005 NBC were also reviewed.

In addition, the 2005 NBC's new objectives and intent statements were used to organize the requirements under the following key issues categories:

- Egress and Exiting
- Fire Separation/Compartmentation
- Fire Detection
- Livability
- General Safety
- Electrical Safety
- Heating, Air Conditioning and Ventilation
- Fire Department Access and
- Fire Exposure

The objectives and intent statements in the 2005 NBC were also used to help rate the relative importance of requirements (see Weighted Performance Rating, below).

Comparison with Provincial/Territorial Codes

As mentioned above, PEI was the only Province whose building code was not based on the NBC. British Columbia was the only Province with specific regulations for accessory apartments, as distinct from a duplex or multi-unit building. Nova Scotia, Ontario and Quebec all had supplementary parts of their codes with provisions for renovation projects. Other provinces adopted the NBC provisions with or without amendments. The consultants prepared tables identifying where code provisions affecting accessory apartments were the same as the NBC, or where the requirements differed, or where a provision found in the NBC was not addressed in the provincial/territorial codes.

Comparison with Municipal Bylaws

A number of municipalities had introduced regulations for accessory apartments. The approaches of five were chosen as examples: Sidney, Surrey and Vancouver in British Columbia, plus Saskatoon and Montréal. Most of these municipalities had limited the scope of their regulations by defining 'accessory apartments' in terms of size, ownership, and/or number of occupants, and some required the owner to live in one of the suites. The consultants prepared tables comparing requirements with those in the NBC, as above.

Weighted Performance Rating

The consultants and the project steering committee members assigned each relevant provision in the NBC a weighting on a scale of 1 (low) to 5 (high), reflecting its priority as compared with other provisions. Requirements that relate to life safety were assigned higher weightings than requirements that relate to comfort. Then, the consultants rated the performance level, meaning the contribution to occupant health and safety, of each provincial, territorial and municipal code provision on a scale of 1 to 5, with 3 being the base level assigned to each NBC provision. Together, these provided a weighted performance level for each of the key issues. Finally, an overall performance level was determined for each code, normalized to the NBC.

It is important to remember that the performance ratings measure only the performance of the requirements applicable to an accessory apartment that would be over and above the requirements applicable to a single dwelling unit.

Figure 3 **Case Studies:** Accessory apartment floor plans for existing and new houses, used for comparison of code requirements and costing

Cost Estimates

Two typical house plans (see Figure 3) with different floor layouts were used for the costing exercise – one for adding an accessory apartment in an existing home and one for new construction. Both assumed a detached building with a basement apartment area of approximately 60 m^2, electric baseboard heating, and poured concrete walls (with a clear height to the underside of floor joists of 2200 mm for the renovation in an existing building and 2400 mm for new construction). Wherever possible, material and labour costs were estimated for individual code provisions. Only those costs directly related to additional code requirements beyond those for a single family house were estimated (refer to Figures 4 and 5). Other costs such as normal electrical service, fit up of kitchen and bathroom, appliances, furniture, etc. were not included.

The study noted that costs can be considerably higher in situations that differ from these two typical house plans. For example, if the project is a semi-detached house, many jurisdictions require higher fire protection for the party walls (for example: a fire wall or higher fire resistance rating may be needed). For projects in existing houses, costs can vary widely, depending on the construction and layout. Costs may increase substantially if the basement floor has to be lowered to achieve minimum room heights, if windows must be added or increased in size, or if exit/egress requirements demand structural changes[1]. On the other hand, exemptions and equivalencies may be permitted on a case-by-case basis, which would reduce costs.

KEY FINDINGS

Cost and performance vary according to jurisdiction:

- The costs associated with construction of the example accessory apartments in new or existing buildings are highest under the requirements of the NBC and the other jurisdictions that adopt it with few or no modifications.
- The costs and rated performance levels under the Prince Edward Island code, and the Vancouver and Montréal bylaws both appear to be significantly lower than those in other jurisdictions.
- Construction costs change in the same direction as the rated level of performance required in a jurisdiction, although the degree of change differs.

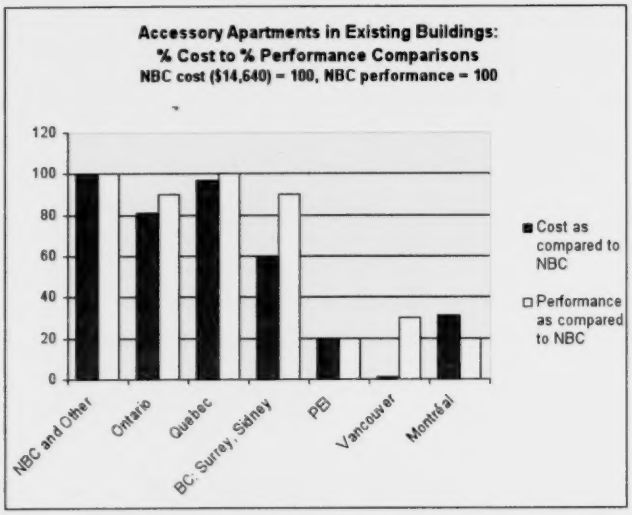

Figure 4 Accessory apartment in an existing house: Comparison of Cost and Performance (expressed as percentages) attributed to code requirements in the National Building Code and other similar codes; Ontario; Quebec, Surrey and Sidney, British Columbia; Prince Edward Island; Vancouver, British Columbia; and Montréal, Quebec.

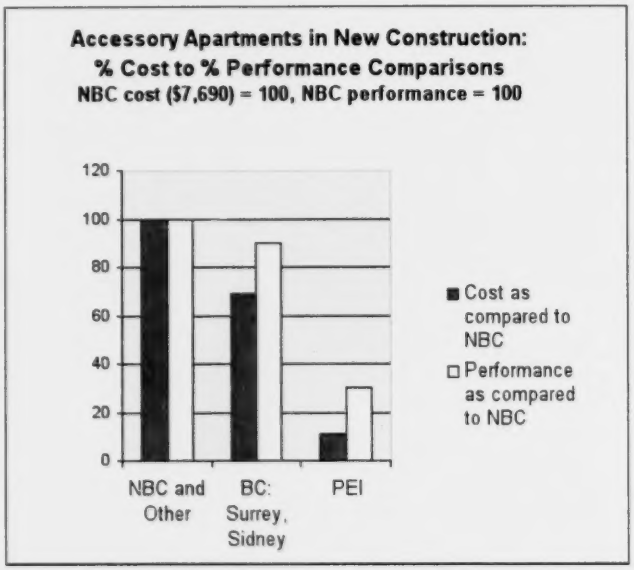

Figure 5 Accessory apartment in a new house: Comparison of Cost and Performance (expressed as percentages) attributed to code requirements in the National Building Code and other similar codes; Surrey and Sidney, British Columbia; and Prince Edward Island.

[1] Although the NBC allows building officials to accept alternative solutions providing 'equivalent' levels of safety, it does not contain specific provisions covering when and how existing construction can be accepted in a renovation project.

Some code requirements result in large costs to achieve a relatively small increment in rated performance. Some relaxations and exemptions in code requirements compared with the NBC appear to produce appreciable cost savings with a relatively small decrease in rated performance.

The impacts of the approaches that different jurisdictions have taken to code requirements are shown in Figure 6 (Existing Buildings) and Figure 7 (New Construction). Results are grouped under the nine Key Issues. In each case, the performance of the NBC provision was considered to equal 1.0; the performance of each provision in other codes ranged from 0 to 2.7. The heading 'NBC and Other' includes most provinces and territories not shown separately, as their requirements are considered to be the same as the NBC.

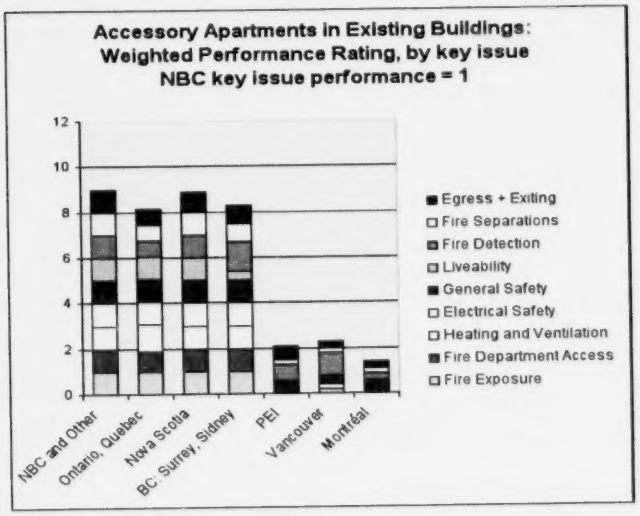

Figure 6 Accessory apartment in an existing house: Comparison of Weighted Performance Ratings by Key Issue in the National Building Code and other similar codes; Ontario; Quebec, Nova Scotia, Surrey and Sidney, British Columbia; Prince Edward Island;Vancouver, British Columbia; and Montréal, Quebec.

Figure 6 shows some jurisdictions that have introduced variations to the NBC provisions which apply to an accessory apartment in an existing building. Although their building codes emphasize different key issues, all jurisdictions have requirements for egress and exiting, fire separations, fire detection and fire department access. The requirements in Prince Edward Island, Vancouver and Montréal are more lenient than the NBC because they treat the entire house as being similar to a single dwelling unit.

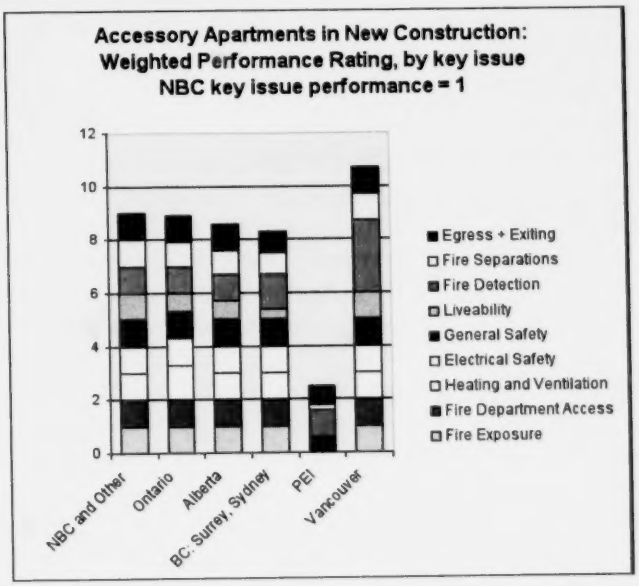

Figure 7 Accessory apartment in new construction: Comparison of Weighted Performance Ratings by Key Issue in the National Building Code and other similar codes; Ontario; Alberta; Surrey and Sidney, British Columbia; Prince Edward Island; and Vancouver, British Columbia.

Figure 7 shows that the overall weighted performance ratings for accessory apartments in new houses are comparable in the NBC and other similar codes; Ontario; Alberta; and Surrey and Sidney, British Columbia. The performance attributed to accessory apartments in Vancouver exceeds the NBC because the Vancouver code requires sprinklers in all new houses. Due to the absence of a building code for Prince Edward Island, its performance rating was determined by the requirements of the National Fire Protection Association Life Safety Code (NFPA 101)[2].

CASE STUDY EXAMPLES FOR RENOVATIONS OR AN EXISTING HOUSE

The study identified priority ratings, costs and performance for a few specific provisions in the NBC governing the addition of an accessory apartment to an existing house, and the equivalent requirements in other jurisdictions. Where the text refers to British Columbia, it means the code requirements in effect in the municipalities of Surrey and Sidney. Where it refers to Quebec, it means those code requirements applying to buildings more than five years old. The case study below identifies some code requirements and

[2] Prince Edward Island has adopted the National Fire Protection Association Life Safety Code (NFPA 101).

the costs attributed to these requirements, of providing an accessory apartment in an existing basement (refer to figure 3: Existing House).

Key Issue: Egress and Exiting

Provision 1: Window Wells

NBC 1995 9.7.1.4 requires a 550 mm clearance at window wells (which may be used as an alternate escape route). The study assigned this provision a priority weighting of 4 out of 5, and estimated the cost of enlarging a standard window well at $450. Quebec and British Columbia call for an increase in the clearance provided by the window well; therefore, the same estimated cost was attributed to the NBC, Quebec and British Columbia. Montréal and Vancouver have no equivalent requirement.

NBC:	$450
Quebec	$450
BC	$450
Montréal	$ 0
Vancouver	$ 0

Provision 2: Separate Exits

NBC 1995 9.9.9.3 requires a second means of egress when an egress door opens onto a shared exit stair. This was assigned a priority weighting of 4 out of 5 and the cost was estimated at $1,000. (Instead of providing a second egress, this project would separate the shared exit area to provide direct access to the garage from the main dwelling unit, and direct access to the exterior for the accessory apartment.) Quebec and British Columbia call for shared exits to be fire separated into two separate exits; therefore, the same estimated cost was attributed to the NBC, Quebec and British Columbia. Montréal and Vancouver have no equivalent requirement.

NBC:	$1,000
Quebec	$1,000
BC	$1,000
Montréal	$ 0
Vancouver	$ 0

Provision 3: Emergency Lighting for Exit Route

NBC 1995 9.9.11.3 requires emergency lighting in exits and public corridors. This was assigned a priority weighting of 2 out of 5 and the cost was estimated at $300. Quebec and British Columbia have equivalent requirements. Montréal and Vancouver do not.

NBC:	$300
Quebec	$300
BC	$300
Montréal	$ 0
Vancouver	$ 0

Key Issue: Fire Separations (Compartmentation)

Provision 4: Fire Resistance Rating For Exit

NBC 1995 9.9.4.2.(1)(2) requires the exit to be separated from the other dwellings and the garage with a minimum 45 minute fire resistance rating. This was assigned a priority weighting of 4 out of 5 and the cost (fire rated walls and ceiling plus three doors) was estimated at $3,000. Quebec has similar requirements; therefore, the same estimated cost was attributed to the NBC and Quebec. British Columbia accepts existing construction (which the consultants estimated would generally have a fire resistance rating of 30 minutes). Montréal and Vancouver have no equivalent requirement.

NBC:	$3,000
Quebec	$3,000
BC	$ 0
Montréal	$ 0
Vancouver	$ 0

Provision 5: Where Combustible Piping is Permitted

NBC 1995 9.10.9.7.(5) and (6) allow combustible drain, waste and vent piping only on one side of a vertical and horizontal fire separation. This was assigned a priority weighting of 3 out of 5 and the cost (fire rated bulkhead in the accessory apartment) was estimated at $200. Quebec has similar requirements; therefore, the same estimated cost was attributed to the NBC and Quebec. British Columbia permits combustible piping on both sides of the fire separation; therefore, no additional cost was attributed. Montréal and Vancouver have no equivalent requirement.

NBC:	$200
Quebec	$200
BC	$ 0
Montréal	$ 0
Vancouver	$ 0

Key Issue: Fire Detection

Provision 6: Smoke Detectors

NBC 1995 9.10.18 requires hard-wired smoke detectors in each unit, interconnected within the unit so that if one goes off all will sound. This was assigned a priority weighting of 5 out of 5 and the cost was estimated at $150. Quebec calls for interconnected hard-wired smoke detectors, at the same estimated cost. So does Vancouver. British Columbia requires hard-wired smoke detectors plus photoelectric smoke alarms, for an estimated cost of $300. Montréal allows less costly battery-operated smoke detectors in buildings constructed before Aug. 27, 1985.

NBC:	$150
Quebec	$150
BC	$300
Montréal	$ 30
Vancouver	$300

Key Issue: Livability

Provision 7: Laundry Facilities

NBC 1995 9.31.4.2 requires laundry facilities to be provided in each unit, or to be provided elsewhere and accessible to each unit. This was assigned a priority weighting of 2 out of 5 and the cost (rough-in services, no appliances) was estimated at $600. Quebec and British Columbia call for similar rough-ins at the same cost. Montréal and Vancouver have no equivalent requirement.

NBC:	$600
Quebec	$600
BC	$600
Montréal	$ 0
Vancouver	$ 0

(This requirement was dropped from the 2005 NBC.)

Key Issue: Heating and Ventilation

Provision 8: HVAC to Serve only One Unit

NBC 1995 9.33.1.1 requires that heating and air conditioning systems, including provision of combustion air, serve only one dwelling unit or be designed to Part 6. This was assigned a priority weighting of 3 out of 5 and the cost (stand-alone electric heating in the accessory apartment) was estimated at $600. Quebec and British Columbia have similar requirements at the same cost. Montréal and Vancouver have no equivalent requirement.

NBC:	$600
Quebec	$600
BC	$600
Montréal	$ 0
Vancouver	$ 0

Key Issue: Fire Exposure

Provision 9: Openings in Exterior Walls

NBC 1995 9.10.12.4 requires openings in exterior walls of adjacent dwelling units to be separated by a minimum 1.2 m fire rated construction. This was assigned a priority weighting of 3 out of 5 and the cost (protection for the garage exterior wall beside the accessory apartment living/dining room window) was estimated at $300. (Relocating the window would be more expensive.) Quebec and British Columbia have similar requirements at the same estimated cost. Montréal and Vancouver have no equivalent requirement.

NBC:	$300
Quebec	$300
BC	$300
Montréal	$ 0
Vancouver	$ 0

The estimated costs of all code provisions that govern accessory apartments in existing buildings over and above the cost of code requirements applicable to a single dwelling unit were summed up, and the weighted performance of all code provisions was calculated for each jurisdiction. Figure 8 shows that the code provisions for Surrey and Sidney, British Columbia provide about 90 percent of the performance of the NBC requirements for an estimated 60 percent of the cost. In Vancouver, where sprinklers are mandatory, about 30 percent of the performance of the NBC requirements is provided for an estimated one percent of the cost.

JURISDICTION	Supplementary Costs	Weighted Performance
NBC and Other	$12,640	1.0
Quebec	$12,640	1.0
BC (Surrey and Sidney)	$ 7,190	0.9
Montréal	$ 4,530	0.2
Vancouver	$ 150	0.3

Figure 8 Accessory apartment in an existing house: Estimated Supplementary Costs* and comparison of Weighted Performance attributed to building code provisions governing the construction of the example accessory apartment in the National Building Code and other similar codes; Surrey and Sidney, British Columbia; Montréal, Quebec; and Vancouver, British Columbia.

*Estimated costs over and above the cost of code requirements applicable to a single dwelling unit.

HARMONIZATION

As noted above, accessory apartments are one housing type for which code/bylaw requirements differ substantially across the country. There have been many requests for the NBC's requirements to be re-examined in light of the varying approaches. These requests have three goals:

- to produce technically sound national model requirements which do not discourage creation of this form of affordable housing,
- to provide comparable levels of health and safety for this form of housing across Canada, and
- to provide for greater harmonization amongst building codes in Canada.

In 2007, the Standing Committee on Part 9 of the NBC established a Task Group to propose new requirements for accessory apartments to be included in the 2010 NBC. At their first meeting they heard presentations from CMHC on recent research, from Morrison Hershfield on the research summarized by this paper, and from Alberta on its then-just-published code section for secondary suites[3].

By doing much of the 'spade work' on comparisons and ratings in advance, this research enabled the task group to proceed quickly in its deliberations to address the three aforementioned objectives. Proposed approaches to meet these objectives were submitted to the Standing Committee on Housing and Small Buildings in the fall of 2007, and proposed code changes for the 2010 NBC were submitted in spring of 2008.

The proposed code changes include several significant relaxations, some new alternative approaches, and some additional requirements for accessory apartments. The proposed changes for the 2010 NBC are the same for new buildings and renovations, because the NBC doesn't differentiate between these types of construction. The Task Group weighed the costs and benefits of each code provision when choosing the wording of the proposed NBC requirements for accessory apartments.

After a review by the Provincial/Territorial Policy Advisory Committee on Building Codes, the proposed changes were sent out for public review in the fall of 2008. Those accepted will be included in the 2010 version of the NBC.

IMPLICATIONS FOR THE HOUSING INDUSTRY

The CMHC Research Report: "Code Requirements and Costs of Incorporating Accessory Apartments in Houses" provided a framework to compare the code provisions for accessory apartments in jurisdictions across Canada. It brought together all requirements for this form of housing from the different building codes in force in Canada in 2005. This research provided a sound basis for comparison of different code provisions and their impact on housing costs, which enabled the NBC Task Group to proceed quickly towards preparing proposed changes for accessory apartments in the 2010 NBC. If included in the next edition of the NBC, these changes will affect Canadian housing in the following ways:

- Building officials, builders and occupants will benefit from new code requirements for accessory apartments, which have resulted from a rigorous consultation process involving code experts, building inspectors, housing designers and builders.
- The requirements for accessory apartments will be harmonized across Canada when they are adopted or adapted into provincial, territorial and municipal codes.
- The requirements for accessory apartments will be easier to satisfy than those in the current NBC without compromising occupant health and safety.
- The costs of satisfying the code requirements for accessory apartments may be significantly reduced, especially for renovations to existing buildings, making accessory apartments an affordable rental housing option.

FURTHER INFORMATION

The CMHC research report "Code Requirements and Costs of Incorporating Accessory Apartments in Houses" is available at the Canadian Housing Information Centre (CHIC), and can be downloaded from the CMHC website: www.cmhc.ca

[3] Since this research was completed, Alberta has reviewed its requirements for accessory apartments and introduced changes. Regulations for new construction came into effect 31-12-2007 and those for existing construction will come into effect 31-12-2009.

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Housing Research at CMHC

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